ES3508-TX
E0398-R01
150849-101

Accton
Making Partnership Work

Fast SwitchHub-8mi SNMP
Advanced Reference Guide

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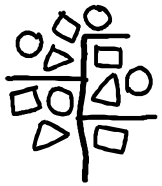
Fast SwitchHub-8mi SNMP

Intelligent Fast Ethernet Switch
with 8 10BASE-T/100BASE-TX Ports
and On-board SNMP Management Agent



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Introduction

The on-board management agent in the Fast SwitchHub-8mi SNMP provides the switch with advanced management capabilities. The SwitchHub's SNMP agent module includes a menu-driven configuration program that can be accessed by connecting a terminal or PC to the serial port on the rear panel. You can also access the configuration program by an in-band Telnet connection, or perform in-band management from any network management station running SNMP management software (e.g., AccView/Open).

The on-board configuration program allows you to perform the following tasks:

- Enable/disable any port
- Set the communication mode for any port
- Set the switching mode
- Configure SNMP parameters
- Configure VLAN port grouping
- Enable and configure the Spanning Tree Algorithm
- Restart the system

Making the Connections Required for System Configuration

The SwitchHub provides a menu-driven configuration program. Also the SNMP agent allows you to manage the switch from any PC attached to the network using in-band network management software (e.g., AccView/Open).

Note: Limited configuration (i.e., selecting the port transmission mode) and panel display selection can be carried out with the Configure button on the front panel. (Refer to the Quick Installation Guide.)

This section describes how to access the menu-driven configuration program via:

- **Onsite connection** - A terminal or workstation directly connected to the serial port on the switch.
- **Modem connection** - A workstation connected to a remote SwitchHub via modems.
- **Telnet connection** - A workstation connected to a remote SwitchHub via a network Telnet connection.

It also describes how to access the on-board SNMP agent over the network from a network management station (NMS) using network management software.

Onsite Connection

Attach a VT100 compatible terminal or a PC running a terminal emulation program to the serial port on the SwitchHub's rear panel. Use the null-modem cable provided with the product package, or use a null modem cable that complies with the wiring assignments shown in the back of this guide.

When attaching to a PC, set terminal emulation type to VT100, specify the port used by your PC (i.e., COM 1~4), and then set communications to 8 data bits, 1 stop bit, no parity, and 9600 bps. Also be sure to set flow control to "none."

Modem Connection

Configure the SwitchHub Site: Connect the switch's DB9 port to the modem's serial port using standard cabling. For most modems which use a 25-pin port, you will have to provide an RS232 cable with a 9-pin connector on one end and a 25-pin connection on the other end. You do not have to set the modem at the switch's site, because the switch will automatically configure it to auto-answer mode.

Configure the Remote Site: At the remote site, connect the PC's COM port (COM 1~4) to the modem's serial port. Set terminal emulation type to VT100, specify the port used by your PC (i.e., COM 1~4), and then set communications to 8 data bits, 1 stop bit, no parity, 9600 or 19200 bps and no flow control.

Telnet Connection

Prior to accessing the switch via an in-band Telnet connection or in-band management software (e.g., AccView/Open), you must first configure it with a valid IP address, subnet mask, and default gateway using an out-of-band connection. After configuring the switch's IP parameters, you can Telnet into its on-board menu-driven configuration program from anywhere within the attached network.

Note: Only one Telnet connection at a time is supported. If one Telnet session already exists, a second Telnet connection will not be able to log into the system.

In-Band Network Connection

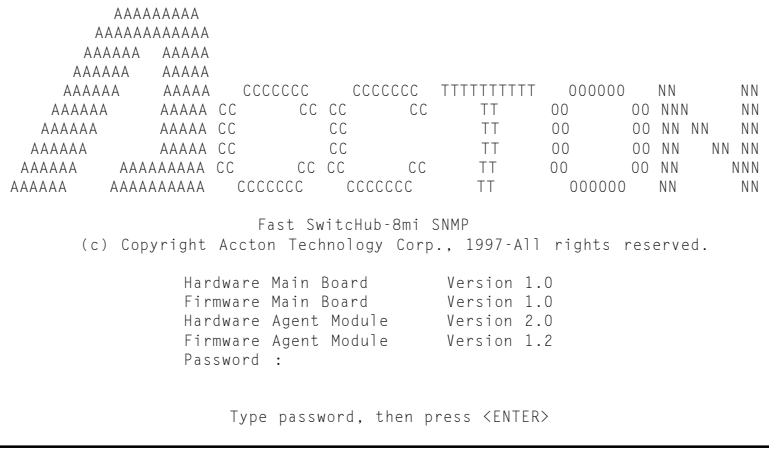
The in-band network management station is the personal computer used to run your network management software. If proper network connections are available, you can access the on-board management agent from anywhere in the attached network. However, prior to accessing the SwitchHub via network management software, you must first configure it with a valid IP address, subnet mask, and default gateway using an out-of-band connection or the BOOTP protocol.

Note that the on-board program configuration functions only provide access to the switch's private MIB. To access the full range of SNMP management functions, you must use network management software.

Note: To access the full range of SNMP mangement functions, you must use SNMP-based network mangement software. Accton provides Windows-based SNMP software called AccView/Open. Note that AccView/Open's Fast SwitchHub-8mi SNMP Manager software can also be easily integrated into most third-party management platforms.

Configuring Your System with the On-board Program

Once the connection is established, the login screen for the on-board configuration program appears as shown below.


Fast SwitchHub-8mi SNMP
(c) Copyright Accton Technology Corp., 1997-All rights reserved.
Hardware Main Board Version 1.0
Firmware Main Board Version 1.0
Hardware Agent Module Version 2.0
Firmware Agent Module Version 1.2
Password :
Type password, then press <ENTER>

If this is your first time to log into the configuration program, then the default passwords are still "admin" and "guest." The admin password provides administrator rights with Read/Write access to all configuration parameters and statistical information. While the guest password provides observer rights with Read Only access to the management program. Type "admin" at this time and press <Enter> to open the Main Menu.

You should define a password, record it and put it in a safe place. Select Password Configuration from the Main Menu and enter a password. Note that passwords can consist of up to 24 alphanumeric characters and are not case sensitive.

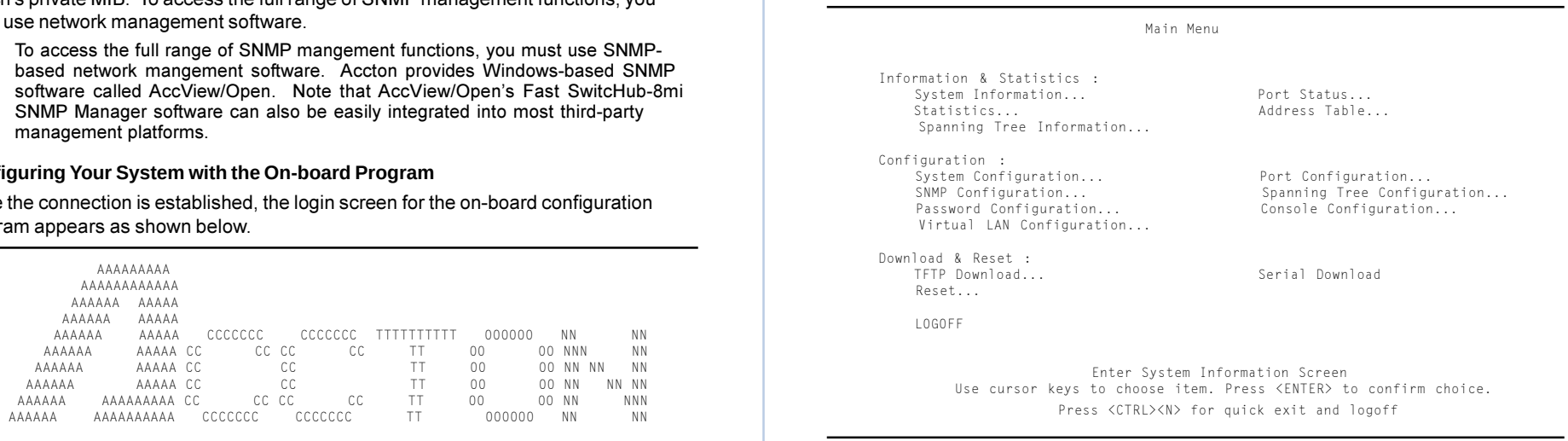
Configuration parameters are described in the following section.

Notes: 1. Only one connection with administrator rights is allowed to log into the system at one time. If one administrator session already exists, a second connection with administrator rights will not be able to log in to the system.
2. A user is allowed three attempts to enter the correct password; on the third failed attempt the user will be locked out of the system.

Using the System Configuration Program

With the system configuration program you can define system parameters, manage and control the switch and its associated ports, or monitor network conditions. The figure below of the Main Menu and the following table briefly describe the selections available from this program.

Note: Input options for the currently selected item are displayed in the highlighted area at the bottom of the interface screen.



Menu	Description
Configuration	
System Configuration	Identifies system by name, location and contact. Also shows basic IP setup.
SNMP Configuration	Configures communities and trap managers.
Password Configuration	Sets Administrator and User passwords.
Virtual LAN Configuration	Assigns switch ports to form up to eight independent LAN groups.

Menu	Description (continued)
Port Configuration	Disables/enables any port; sets communication mode to auto-negotiation, full duplex or half duplex; sets the aging time for entries in the address table, the processing scheme for forwarding packets to adaptive cut-through, cut-through, fragment-free cut-through, or store-and-forward; and enables/disables flow control.
Spanning Tree Configuration	Enables/disables Spanning Tree Algorithm; also sets parameters for switch priority, hello time, maximum message age, and forward delay; as well as port priority and path cost.
Console Configuration	Sets the communication parameters for the serial port, including baud rate and console time-out.
Information & Statistics	
System Information	Provides detailed system description, including MAC address, MIB identifier, network interface type, and other basic system information.
Statistics	Shows statistics for the whole switch or for each port, including lost frames, dropped frames, and currently active stations.
Spanning Tree Information	Displays full listing of parameters for Spanning Tree Algorithm.
Port Status	Shows the operational state for each port, including enable/disable, link status, transmission speed and mode, forwarding scheme, and flow control
Address Table	Shows the current addresses associated with each port.
Download & Reset	
TFTP Download	Downloads new version of firmware to update your system (via in-band).
Serial Download	Downloads new firmware to update your system (via on-board program).
Reset	Resets hardware or configuration parameters, or clears port address table.
LOGOFF	Exits the configuration program and discontinues communications.

Performing Basic Configuration

After initially logging onto the system, use the Configuration menu to adjust the communication parameters for your console to ensure a reliable connection. Next, set the Administrator and User passwords. Remember to record them in a safe place. Then set the community string which controls access to the on-board SNMP agent via in-band management software.

The other items provided by the Configuration menu are used to set specific communication parameters for individual ports, and to fine-tune the performance of your switch by adjusting the forwarding mode, flow control, and specific Spanning Tree parameters. Each setup screen provided by the Configuration menu is described in the following sections.

Changing the System Configuration

Use the System Configuration screen to display and modify descriptive information about the switch, or to configure the switch's Internet Protocol (IP) parameters. This screen, as seen below, is described in the following table.

```
                        System Configuration

  System Name                    Fast SwitchHub-8mi SNMP
  System Location                MIS
  System Contact                 Accton Technical Support Dept.

  IP Address                     192.72.24.31
  Default Gateway                192.72.24.202
  Subnet Mask                    255.255.255.0
  IP State                       BootP When Needed
  Send Ping

  Return to Previous Menu


                          Return to Main Menu
      Use cursor keys to choose item. Press <ENTER> to confirm choice.
                Press <CTRL><N> to return to the Main Menu
```

Name	Description
System Description	
System Name	Name assigned to the SwitcHub system (max. 30 alphanumeric characters).
System Location	Specifies the area or location where the system resides (max. 30 alphanumeric characters).
System Contact	Contact person for the system (max. 30 alphanumeric characters).
IP Configuration	
IP Address	IP address of the agent you're managing. The SwitcHub system supports SNMP over UDP/IP transport protocol. In this environment, all systems on the Internet, such as network interconnection devices and Network Management Stations (e.g., a PC running AccView/Open) are assigned an IP address. Valid IP addresses consist of four numbers, of 0 to 255, separated by periods, anything outside of this format will not be accepted by the configuration program.
Default Gateway	Gateway used in passing trap messages from the SwitcHub agent to the management station.
Subnet Mask	Subnet mask of the agent you've selected. This mask identifies the host address bits used for routing to specific subnets.
IP State	Specifies whether or not the IP address is set by the Boot Protocol (BOOTP). Options include: IP Disabled - The switch will not process any IP or Address Resolution Protocol (ARP) frames it receives. It will not respond to SNMP, Ping, Telnet or ARP frames that are received. BOOTP When Needed - If a non-zero IP address has been stored in EEPROM, IP is enabled and will function immediately. However, if the IP address in EEPROM is zero (0.0.0.0), the switch will broadcast BOOTP requests to try to learn its IP address. This is the only IP function that will work until it receives a response. This is the default option. BOOTP Always - IP is enabled, but will not function until a BOOTP reply has been received. If a non-zero IP address is stored in EEPROM, it will be cleared to zero when the switch is booted.
Send Ping	Sends ICMP echo request to specified site. Ping is used to see if another site on the internet can be reached.

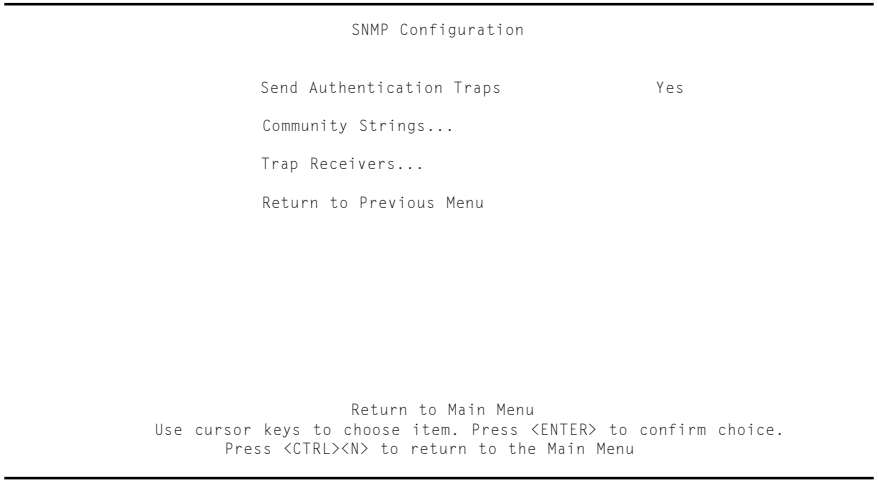
BOOTP - When BOOTP is selected, the switch repeats requests at regular intervals, until it receives a valid reply. The requests will cease if a valid IP address is configured or the IP state is set to IP Disabled.

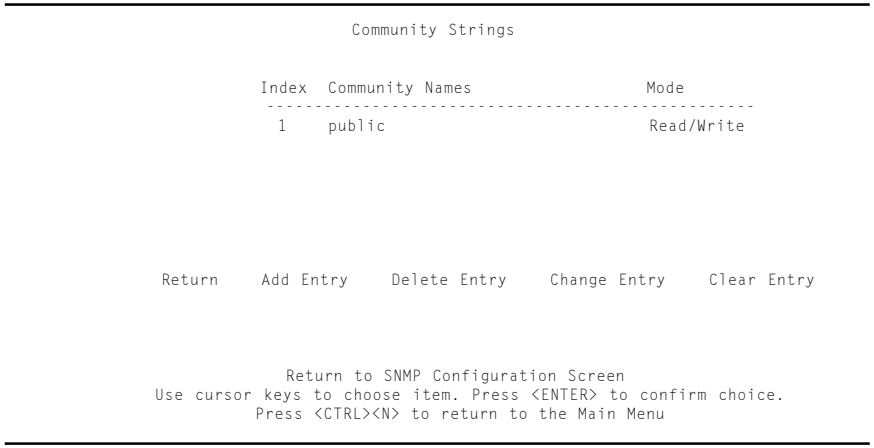
Once the switch stops sending BOOTP requests, it does not resume sending requests or recognize BOOTP responses unless the switch is reset. The parameters in a BOOTP response that are recognized and recorded in the switch's EEPROM are:

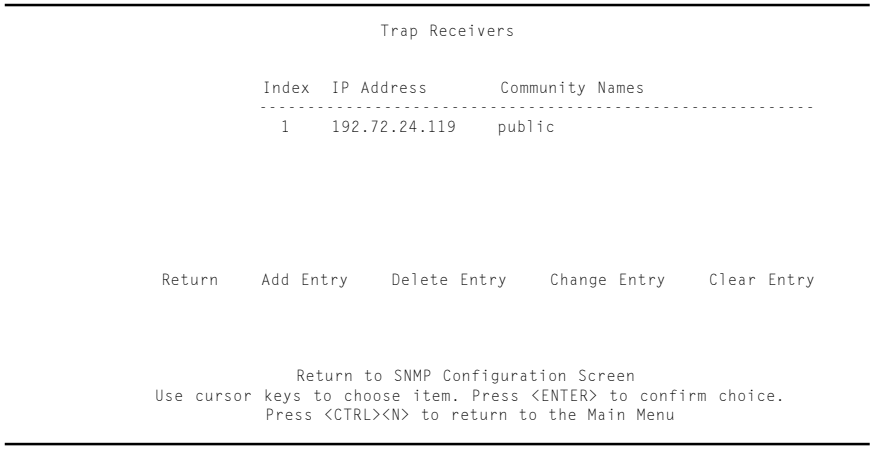
- IP Address
- Default Gateway
- Subnet Mask
- TFTP Boot File Name
- TFTP Server IP Address

Assigning SNMP Parameters

Use the SNMP Configuration screen to display and modify parameters for the Simple Network Management Protocol (SNMP). The switch includes an on-board SNMP agent which monitors the status of its hardware, as well as the traffic passing through its ports. A computer attached to the network, called a Network Management Station (NMS), can be used to access this information. Access rights to the on-board agent are controlled by community strings. To communicate with the switch, the NMS must first submit a valid community string for authentication. The options for configuring community strings and related trap functions are described in the following figures and table:


SNMP Configuration
Send Authentication Traps Yes
Community Strings...
Trap Receivers...
Return to Previous Menu
Return to Main Menu
Use cursor keys to choose item. Press <ENTER> to confirm choice.
Press <CTRL><N> to return to the Main Menu


Community Strings
Index Community Names Mode
1 public Read/Write
Return Add Entry Delete Entry Change Entry Clear Entry
Return to SNMP Configuration Screen
Use cursor keys to choose item. Press <ENTER> to confirm choice.
Press <CTRL><N> to return to the Main Menu


Trap Receivers
Index IP Address Community Names
1 192.72.24.119 public
Return Add Entry Delete Entry Change Entry Clear Entry
Return to SNMP Configuration Screen
Use cursor keys to choose item. Press <ENTER> to confirm choice.
Press <CTRL><N> to return to the Main Menu

Name	Description
Send Authentication Traps	Issue a trap message whenever authentication of an SNMP request fails. The default is to issue traps to specified receiver stations.
Community Strings[1]	The community strings authorized for trap management access. All community strings used for IP Trap Managers must be listed in this table. Up to 8 community names may be entered.
Community Name	A community entry authorized for trap management access (maximum 30 characters).
Mode	Management access is restricted to Read or Read/Write.
Trap Receivers	IP management stations selected to receive trap messages from the system. Up to 8 trap receivers may be entered in this table.
IP Address	IP address of the management station.
Community Name	The community string required for trap management access (maximum 30 characters).

1 - This switch provides a default community string of "Public" with Read/Write access.

Changing System Passwords

Use the Password Configuration screen to display and modify passwords for the on-board configuration program. There are two user types, "Administrator" and " Normal User," the access privilege is Read/Write for Administrator and Read Only for Normal User. The default passwords are "Admin" and "Guest." Only the Administrator has write access for parameters governing the SNMP agent. You should therefore assign a password to the Administrator as soon as possible, and store it in a safe place.

Passwords can consist of up to 24 alphanumeric characters and are not case sensitive. The configuration program will allow a user three attempts at entering a correct password before locking the user out by terminating the connection. If for some reason your password is lost, or you can not gain access to the System Configuration Program, you should contact your Accton distributor for assistance.

The Password Configuration screen appears as shown below.

```
                    Password Configuration


                  Set Administrator Password

                  Set Normal User Password

                  Return to Previous Menu



            input old administrator password :

                   Change password of the Administrator
          Press <CTRL><X> to cancel. Press <ENTER> to accept changes.
```

Port Grouping Configuration

Use the Virtual LAN Configuration: Port Grouping Configuration screen to assign any port on the switch to any of up to eight LAN groups. In conventional networks with routers, broadcast traffic is split up into separate domains. Switches do not inherently support broadcast domains. This can lead to broadcast storms in large networks that handle a lot of IPX traffic. Port grouping can be used to create broadcast domains, confining broadcast traffic to the originating group, and providing a much cleaner network environment.

```
                        Port Grouping Configuration

 Port   Group1   Group2   Group3   Group4   Group5   Group6   Group7   Group8
 ----------------------------------------------------------------------------
  1      Yes      No       No       No       No       No       No       No
  2      Yes      No       No       No       No       No       No       No
  3      Yes      No       No       No       No       No       No       No
  4      Yes      Yes      No       No       No       No       No       No
  5      No       Yes      No       No       No       No       No       No
  6      No       Yes      No       No       No       No       No       No
  7      No       Yes      No       No       No       No       No       No
  8      No       Yes      No       No       No       No       No       No

 Return to Previous Menu


                 Return to Virtual LAN Configuration Screen
            Use cursor keys to choose item. Press <ENTER> to confirm choice.
                   Press <CTRL><N> to return to the Main Menu
```

Parameter	Description
Port	Port number on the switch.
Group1 - 8	You can configure up to a maximum of 8 independent groups. Ports can belong to more than one group. "Yes" indicates that the port has been assigned to that group, "No" indicates it is not assigned. The default is all ports assigned to Group1 only. Note that the Spanning Tree Algorithm will be automatically disabled if two or more groups are configured.

Configuring Port Parameters

Use the Port Configuration screen to configure any port on the switch. In addition to the functional parameters listed in the table below, note that you can also enable/disable any port.

```
                          Port Configuration


 Port   Enabled   Duplex   AgingTime   SwitchingMode   FlowControl
 ------------------------------------------------------------------
 1       Yes      Auto     300         A-CT            Yes
 2       Yes      Full     300         A-CT            Yes
 3       Yes      Full     300         CT              Yes
 4       Yes      Auto     300         A-CT            No
 5       Yes      Auto     300         FgFree          No
 6       Yes      Auto     300         CT              Yes
 7       Yes      Half     300         A-CT            Yes
 8       Yes      Half     300         A-CT            Yes

 Return to Previous Menu


                          Return to Main Menu
            Use cursor keys to choose item. Press <ENTER> to confirm choice.
                   Press <CTRL><N> to return to the Main Menu
```

Parameter	Default	Description
Enabled	Yes	Allows you to disable a port due to abnormal behavior (e.g., excessive collisions), and then re-enable it after the problem has been resolved. You may also disable a port for security reasons.
Duplex	Auto	Ports support auto-negotiation, full duplex, and half duplex.
Aging Time	300 secs.	The time-out period in seconds for aging out dynamically learned forwarding information. The input range is 0 - 43200 seconds.
Switching Mode	A-CT	Sets the method for forwarding packets to "cut-through (CT)," "fragment-free cut-through (FgFree)," "adaptive cut-through (A-CT)," or "store and forward (S & F)." For details, see Switching Methods on the next page.
Flow Control	yes	Used to enable or disable flow control. Flow control relies on back pressure, which can eliminate frame loss by "blocking" traffic from end stations or segments connected directly to the switch when its buffers fill.

Communication Mode - If you use auto-negotiation, be sure the attached device also supports this mode. If any device attached to the switch runs at full duplex, but does not support auto-negotiation, you will need to manually set the communication mode to full duplex. However, once set, the communication mode setting will remain unchanged, even if the link is broken (e.g., by unplugging the cable, or by a power reset).

To restore auto-negotiation after manually selecting half or full duplex, use the Configure button, on-board management program, or SNMP network management software to set the communication mode to auto-negotiation.

Notes: 1. Full duplex can only be used for a dedicated link. When connecting to a shared collision domain (e.g., a repeater hub) be sure the transmission mode is set for half-duplex.
2. The de facto standard for auto-negotiation is used in this switch.

Switching Methods - The SwitchHub employs a dynamic forwarding architecture that enables it to support the following switching modes, "adaptive cut-through," "cut-through," "fragment-free cut-through," and "store-and-forward." The function of each of these switching methods can be described as follows.

- **Cut-through:** A packet is forwarded as soon as the 6-byte destination address in the packet header has been scanned, it does not wait until the entire packet has been received. This technique, which requires the least processing time, reduces the latency of packet transmission to 20 microseconds or less.
- **Fragment-free cut-through:** A packet is forwarded only after the first 64 bytes have been received. This prevents runts from being passed along, effectively cleaning up the data stream. This mode is beneficial when it is probable that the collision rate will be high (i.e., when the switch is used to interconnect several shared segments, each having a large number of end stations).
- **Store-and-forward:** An entire packet is received into a buffer so it can be checked for validity before being forwarded to another port. This prevents errors from being propagated throughout the network.
- **Adaptive cut-through:** This method utilizes Accton's smart algorithm to dynamically change between switching modes based on the current CRC error rate. Switching starts with standard cut-through for a clean data environment, changes to fragment-free cut-through for a higher error rate, and then to store-and-forward for a highly contentious environment.

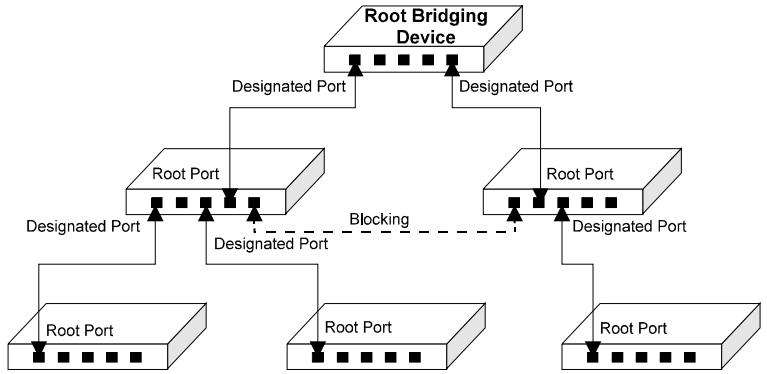
To ensure that you can manage any network load without manual intervention, adaptive-cut-through is used as the default switching method. By using this method, the SwitchHub delivers the best network performance under any environment.

Using the Spanning Tree Algorithm

The Spanning Tree Algorithm (i.e., the STA configuration algorithm as outlined in IEEE 802.1D) can be used to detect and disable network loops, and to provide link backup. This allows the switch to interact with other bridging devices (i.e., STA compliant switch, bridge or router) in your network to ensure that only one route exists between any two stations on the network. If redundant paths or loops are detected, one or more ports are put into a blocking state (i.e., stopped from forwarding packets) to eliminate the extra paths. Moreover, if one or more of the paths in a stable spanning tree topology fail, this algorithm will automatically change ports from blocking state to forwarding state to reestablish contact with all network stations.

The STA uses a distributed algorithm to select a bridging device (i.e., STA compliant switch, bridge or router) that serves as the root of the spanning tree network. It selects a root port on each bridging device (except for the root device) which incurs the lowest path cost when forwarding a packet from that device to the root device. Then it selects a designated bridging device from each LAN which incurs the lowest path cost when forwarding a packet from that LAN to the root device. All ports connected to designated bridging devices are assigned as designated ports. After determining the lowest cost spanning tree, it enables all root ports and designated ports, and disables all other ports. Network packets are therefore only forwarded between root ports and designated ports, eliminating any possible network loops.

The following figure gives an illustration of how the Spanning Tree Algorithm assigns bridging device ports.



Configurable STA parameters can be seen in the figure below and are described in the following table.

```
                    Spanning Tree Configuration

Spanning Tree Algorithm                                          Yes
Priority             32768          Maximum Message Age          20
Hello Time           2              Forward Delay                15

Port              Priority              Path Cost
-------------------------------------------------------
 1                   128                   10
 2                   128                   10
 3                   128                   10
 4                   128                   10
 5                   128                   10
 6                   128                   10
 7                   128                   10
 8                   128                   10

 Return to Previous Menu            Take Effect immediately


                        Return to Main Menu
Use cursor keys to choose item. Press <ENTER> to confirm choice.
            Press <CTRL><N> to return to the Main Menu
```

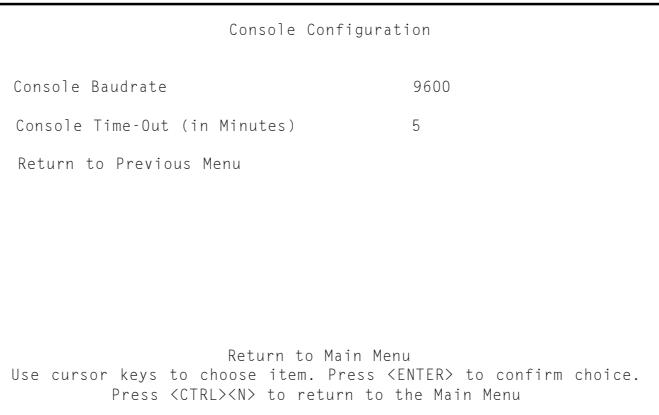
Parameter	Default	Description
Switch		
Spanning Tree Algorithm	Enabled	Enable this parameter to participate in an STA compliant network.
Priority	32,768	Device priority is used in selecting the root device, root port, and designated port. The device with the highest priority becomes the STA root device. However, if all devices have the same priority, the device with the lowest MAC address will then become the root device. Enter a value from 0 - 65535. Remember that the lower the numeric value, the higher the priority.
Hello Time	2	The time interval (in seconds) at which the root device transmits a configuration message. The minimum value is 1. The maximum value is the lower of 10 or [(Max. Message Age / 2) -1].
Maximum Message Age	20	The maximum time (in seconds) a device can wait without receiving a configuration message before attempting to reconfigure. All device ports (except for designated ports) should receive configuration messages at regular intervals. Any port that ages out STA information (provided in the last configuration message) becomes the designated port for the attached LAN. If it is a root port, a new root port is selected from among the device ports attached to the network. The minimum value is the higher of 6 or [2 x (Hello Time + 1)]. The maximum value is the lower of 40 or [2 x (Forward Delay - 1)].
Forward Delay	15	The maximum time (in seconds) the root device will wait before changing states (i.e., listening to learning to forwarding). This delay is required because every device must receive information about topology changes before it starts to forward frames. In addition, each port needs time to listen for conflicting information that would make it return to a blocking state; otherwise, temporary data loops might result. The minimum value is the higher of 4 or [(Max. Message Age / 2) + 1]. The maximum value is 30.
Port		
Priority	128	Defines the priority for the use of a port in the STA algorithm. If the path cost for all ports on a switch are the same, the port with the highest priority (i.e., lowest value) will be configured as an active link in the spanning tree. Where more than one port is assigned the highest priority, the port with lowest numeric identifier will be enabled. The range is 0 - 255.

Parameter	Default	Description (continued)
Path Cost	10 or 100	This parameter is used by the STA algorithm to determine the best path between devices. Therefore, lower values should be assigned to ports attached to faster media, and higher values assigned to ports with slower media. The default is automatically set (depending on the negotiated transmission speed) according to the following formula: Recommended Path Cost = 1000/(LAN speed in Mbps); i.e., default is set at 10 for Fast Ethernet or 100 for standard Ethernet. The range is 0 - 65535. Note: Path cost takes precedence over port priority.

Note: For a listing of the current STA settings, refer to the Spanning Tree Information screen under the Information & Statistics menu.

Configuring the Out-of-Band Console

You can access the on-board configuration program by attaching a VT100 compatible device to the switch's serial port. (For more information on connecting to this port, refer to the section on Making the Connections Required for System Configuration on page 2.) The communication parameters for this port are accessed from the Console Configuration screen seen below and described in the following table.

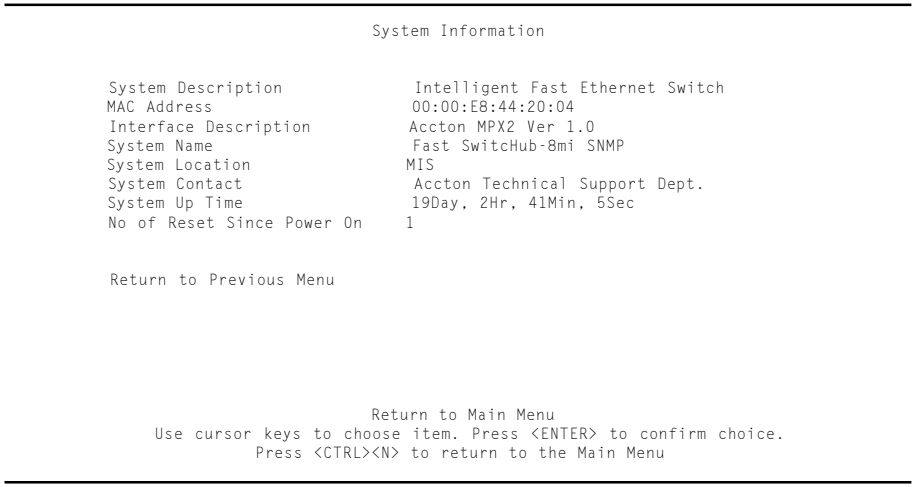

Console Configuration
Console Baudrate 9600
Console Time-Out (in Minutes) 5
Return to Previous Menu
Return to Main Menu
Use cursor keys to choose item. Press <ENTER> to confirm choice.
Press <CTRL><N> to return to the Main Menu

Parameter	Default	Description
Console Baud Rate	9600 bps	The rate at which data is sent between devices. Supported baud rates are 9600, 19200 bps and autobaud.
Console Time-Out	5 minutes	If no input is received from the attached device after this interval (in minutes), the current session is automatically closed. Range: 0 - 60 minutes; where 0 indicates disabled.

Displaying Statistics and Configuration Data

Displaying a Description of the Switch

Use the System Information screen to display descriptive information about the switch, or for quick system identification. This screen is detailed in the figure below and the following table describing the displayed parameters:

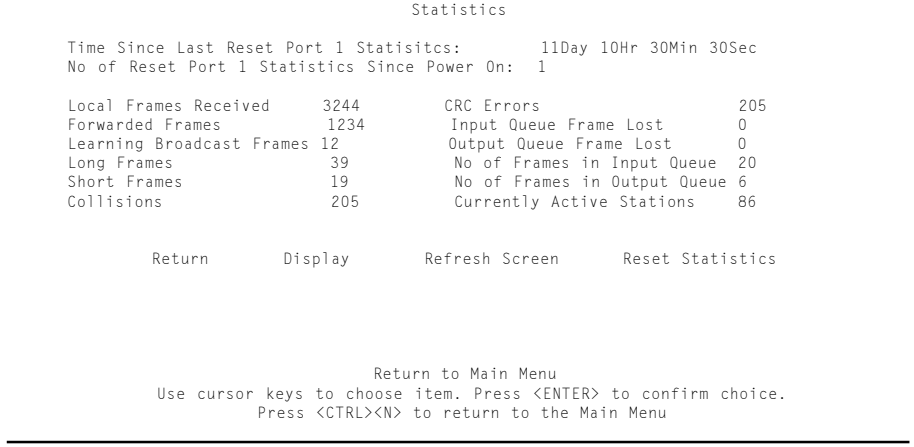

System Information
System Description Intelligent Fast Ethernet Switch
MAC Address 00:00:E8:44:20:04
Interface Description Accton MPX2 Ver 1.0
System Name Fast SwitchHub-8mi SNMP
System Location MIS
System Contact Accton Technical Support Dept.
System Up Time 19Day, 2Hr, 41Min, 5Sec
No of Reset Since Power On 1
Return to Previous Menu
Return to Main Menu
Use cursor keys to choose item. Press <ENTER> to confirm choice.
Press <CTRL><N> to return to the Main Menu

Parameter	Description
System Description	System hardware description.
MAC Address	Hardware address for the switch.
Interface Description	Firmware name and version used in transceiver chips.
System Name	Name assigned to the switch system (maximum 30 characters).
System Location	Specifies the area or location where the system resides (maximum 30 characters).
System Contact	Contact person for the system (maximum 30 characters).
System Up Time	Length of time the switch management agent has been running.
No. of Reset Since Power On	Number of times the switch has been reset.

Displaying Switch and Port Statistics

Use the Statistics screen to display key statistics for each port or the whole switch. The Statistics screen displays overall statistics on the traffic passing through each port, as well as the number of currently active stations. This information can be used to identify potential problems with the switch (e.g., a faulty port). The values displayed have been accumulated since the last system reboot or counter reset.

Use the command options provided by the menu bar at the bottom of the screen. Select "Display" to view statistics for each individual port or the whole switch, or "Refresh" to update the displayed statistics from the MIB. Statistical values displayed by this screen are indicated in the following figure and table.


Statistics
Time Since Last Reset Port 1 Statisitcs: 11Day 10Hr 30Min 30Sec
No of Reset Port 1 Statistics Since Power On: 1
Local Frames Received 3244
Forwarded Frames 1234
Learning Broadcast Frames 12
Long Frames 39
Short Frames 19
Collisions 205
CRC Errors 205
Input Queue Frame Lost 0
Output Queue Frame Lost 0
No of Frames in Input Queue 20
No of Frames in Output Queue 6
Currently Active Stations 86
Return Display Refresh Screen Reset Statistics
Return to Main Menu
Use cursor keys to choose item. Press <ENTER> to confirm choice.
Press <CTRL><N> to return to the Main Menu

Name	Description
Local Frames Received	Number of frames confined to this segment and not forwarded by the switch.
Forwarded Frames	Number of frames forwarded to another segment.
Learning Broadcast Frames	Number of learning broadcast frames received on this port.
Long Frames	Number of times frame length has exceeded the maximum allowable size (i.e., 1518 bytes).
Short Frames	Number of frames less than 64 bytes long.
Collisions	Number of simultaneous node transmissions detected by this port.
CRC Errors	Number of CRC errors.
Input Queue Frame Lost	Number of frames lost because the input queue is full.
Output Queue Frame Lost	Number of frames lost because the output queue is full.
No. of Frames in Input Queue	Number of frames in the input queue.
No. of Frames in Output Queue	Number of frames in the output queue.
Currently Active Stations	Number of entries in the address table (i.e., the sum of all stations listed by this port, regardless of whether they belong to the local segment or to another segment).

Displaying the Address Table

The Address Table contains the MAC addresses associated with each port. (i.e., address and associated source port). To access information in the address tables, use the command options provided by the menu bar at the bottom of the screen. Use the "Display" command to select a port, "More" to scroll through a long listing, or "Search" to find a specific address. The fields displayed by this screen are indicated in the following figure and table.

```
                              Address Table

Time Since Last Clear Port 1 Address Table :       19Day, 3Hr, 43Min, 38Sec
No of Clear Port 1 Address Table Since Power On : 1

       Address            Port              Address            Port
     -------------------------            -------------------------
    00 00 E8 C0 00 01    1                00 00 E8 C0 00 51    1
    00 00 E8 C1 23 56    1                00 00 E8 C1 23 26    1
    00 00 E8 C0 10 51    1                00 00 E8 C0 13 81    1
    00 00 E8 00 42 15    1                00 00 E8 C0 42 25    1
    00 00 E8 C0 60 01    1                00 00 E8 C0 61 04    1
    00 00 E8 C5 23 45    1                00 00 E8 C1 24 33    1
    00 00 E8 C5 23 55    1               --- End of Address Tables ---
    00 00 E8 C5 23 65    1
    00 00 E8 C5 23 75    1

         Return          Display         More            Search


                              Return to Main Menu
                  Use cursor keys to choose item. Press <ENTER> to confirm choice.
                            Press <CTRL><N> to return to the Main Menu
```

Name	Description
Address	The MAC address of a node.
Source Port	The port whose address table includes this MAC address.

Displaying Port Status

The Port Status screen displays the current status for each port on the switch. If you need to modify the connection parameters or switch processing scheme for any port, refer to the earlier section on Configuring Port Parameters. The fields displayed by this screen are indicated in the following figure and table.

```
                                  Port Status

  Port   Enabled   Link   Speed   Duplex   AgingTime   SwitchingMode   FlowControl
 ------------------------------------------------------------------------------
   1       Yes     up     100M     Full      300          A-CT             Yes
   2       Yes     up     100M     Full      300          A-CT             Yes
   3       Yes     up     100M     Full      300          CT               Yes
   4       Yes     up     100M     Full      300          A-CT             Yes
   5       Yes     up     100M     Full      300          FgFree           Yes
   6       Yes     up     100M     Full      300          A-CT             Yes
   7       Yes     down   100M     Half      300          CT               Yes
   8       Yes     down   100M     Half      300          CT               Yes

  Return to Previous Menu


                                  Return to Main Menu
                      Use cursor keys to choose item. Press <ENTER> to confirm choice.
                                Press <CTRL><N> to return to the Main Menu
```


Parameter	Description
Enabled[1]	Shows if the port is enabled or not.
Link	Indicates if a device is attached to the port and transmitting a link pulse signal.
Speed	Shows if the port connection is operating at 10 or 100Mbps. Port speed is automatically set to match the speed of the attached device.
Duplex[1]	Shows if the port is currently operating at full duplex or half duplex.
AgingTime[1]	Time in seconds after which unused addresses will be discarded from the port's address table.
Switching Mode[1]	Shows the method used for forwarding packets as "cut-through," "fragment-free cut-through," "adaptive cut-through," or "store and forward." (See Switching Methods 0n page 11 for a more detailed description of these methods.)
Flow Control[1]	Shows if flow control is enabled or disabled. Flow control uses back pressure, which can eliminate frame loss by "blocking" traffic from end stations or segments connected directly to the switch when its buffers fill up.

1 - Use the Port Configuration screen to change this parameter.

Viewing the Current Spanning Tree Configuration

The Current Spanning Tree Information screen displays a summary of the Spanning Tree configuration for each port. To make any changes to the parameters for the Spanning Tree, use the Configuration Menu. Also note that this screen cannot be accessed unless you have already enabled the Spanning Tree Algorithm via the Configuration Menu. The parameters shown in this screen are indicated in the following figure and table.

```
                          Current Spanning Tree Information

Hello Time : 2                          Max message Age : 20
Forward Delay : 15                      Root : 32768.0000E8C00001
Root Port : 1                           Root Cost : 20
Topology Change Count : 1
Time Since Last Topology Change : 0Day, 9Hr, 9Min, 0Sec

 Port  State        DesignatedCost  DesignatedBridgeID  DesignatedPort
-------------------------------------------------------------------------
  1    Disabled         128        32769.0000E8C02004        128.1
  2    Blocking         128        32770.0000E8C02008        128.1
  3    Listening        128        32771.0000E8C02010        128.1
  4    Learning         128        32772.0000E8C02018        128.1
  5    Forwarding       128        32773.0000E8C02020        128.1
  6    Forwarding       128        32774.0000E8C02028        128.1
  7    Learning         128        32775.0000E8C02038        128.1
  8    Listening        128        32776.0000E8C02040        128.1

Return to Previous Menu

                              Return to Main Menu
                  Use cursor keys to choose item. Press <ENTER> to confirm choice.
                            Press <CTRL><N> to return to the Main Menu
```

Parameter	Description
Hello Time	The time interval (in seconds) at which the root device transmits a configuration message.
Forward Delay	The maximum time (in seconds) the root device will wait before changing states (i.e., listening to learning to forwarding).
Root Port	The number of the port on this switch that is closest to the root. This switch communicates with the root device through this port. If there is no root port, then this switch has been accepted as the root device of the spanning tree network.

Parameter	Description (continued)
Max. Message Age	The maximum time (in seconds) a device can wait without receiving a configuration message before attempting to reconfigure.
Root	The priority and MAC address of the device in the spanning tree that this switch has accepted as the root device.
Root Cost	The path cost from the root port on this switch to the root device.
Topology Change Count	The number of times a switch port has entered the forwarding state, plus the number of times a port has changed from forwarding to blocking. This counter is reset when the switch is reset or the spanning tree is turned on.
Time Since Last Topology	The time since a switch port last entered the forwarding state, or made a transition Change from forwarding to blocking.
Port	The port number on the switch.
State	Displays the current state of this port within the spanning tree: Disabled — Port has been disabled by the user or has failed diagnostics. Blocked — Port receives STA configuration messages, but does not forward packets. Listening — Port will leave blocking state due to topology change, starts transmitting configuration messages, but does not yet forward packets. Learning — Has transmitted configuration messages for an interval set by the Forward Delay parameter without receiving contradictory information. Port address table is cleared, and the port begins learning addresses. Forwarding — The port forwards packets, and continues learning addresses. The rules defining port status are: • A port on a network segment with no other STA compliant bridging device is always forwarding. • If two ports of a switch are connected to the same segment and there is no other STA device attached to this segment, the port with the smaller ID forwards packets and the other is blocked. • All ports are blocked when the switch is booted, then some of them change state to listening, to learning, and then to forwarding.
Designated Cost	The cost for a packet to travel from this port to the root in the current spanning tree configuration. The slower the media, the higher the cost.
Designated Bridge ID	The priority and MAC address of the device through which this port must communicate to reach the root of the spanning tree.
Designated Port	The port on the designated bridging device through which this switch must communicate with the root of the spanning tree.

Downloading System Software

Using TFTP Protocol to Download over the Network

Use the TFTP Download screen under the Download & Reset menu to load software updates into the switch. The download file should be an ES3508 *.bin file from Accton; otherwise the agent will not accept it. The success of the download operation depends on the accessibility of the TFTP server and the quality of the network connection. After downloading the new software, the agent will automatically restart itself. The parameters shown in this screen are indicated in the following figure and table.


```
                        TFTP Download


  TFTP Server Address                    192.72.24.17

  Download Filename                      es3508.bin

  Execute  Network  Download

  Return  to  Previous  Menu



                        Return to Main Menu
  Use cursor keys to choose item. Press <ENTER> to confirm choice.
            Press <CTRL><N> to return to the Main Menu
```

Parameter	Description
TFTP Server Address	IP address of a TFTP server.
Download Filename	The *.bin file to download.
Execute Network Download	Issues request to TFTP server to download the specified file.

Using the Serial Port to Download Out-of-Band

Use the Serial Download command under the Download & Reset menu to update available software in the switch. The download file should be an ES3508 *.bin file from Accton; otherwise the agent will not accept it.

This command specifies direct download from an attached device via the serial port. You may download using any terminal emulation program that can transmit binary files using Xmodem protocol. Position the highlight cursor over "Serial Download" and press the <Enter> key. After selecting a file and the Xmodem protocol, initiate sending the file from your computer by specifying "send" or "upload" file. The terminal emulation program will display the progress of the download process. After downloading the new software, the agent will automatically restart itself.

Resetting the System

Use the Reset command under the Download & Reset menu to reset the system or clear the address table. The information and reset options listed on this screen are detailed in the following figure and table.

```
                              Reset


  Display Diagnostics While Power-On       Yes

  Reset Unit with Diagnostics

  Reset Unit without Diagnostics

  Clear Address Table

  Reset EEprom to Factory Default Value

  Return to Previous Menu



                        Return to Main Menu
  Use cursor keys to choose item. Press <ENTER> to confirm choice.
            Press <CTRL><N> to return to the Main Menu
```

Parameter	Description
Display Diagnostics While Power-On	Diagnostic indicators can be enabled/disabled during a hard reset.
Reset Unit with Diagnostics	Resets the unit and runs diagnostics. Clears all counters and restores configuration parameters from nonvolatile memory. The full process requires about 30 seconds.
Reset Unit without Diagnostics	Resets the unit without running diagnostics. Clears all counters and restores configuration parameters from nonvolatile memory.
Clear Address Table	Clears the address table.
Reset EEprom to Factory Default Value	Resets all counters and restores factory defaults for all configuration parameters.

Logging Off the System

Use the Logoff command under the Main Menu to exit the System Configuration Program and end all communications with the switch for that session.

Troubleshooting

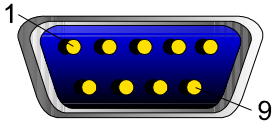
Refer to the Quick Installation Guide for a more detailed listing of troubleshooting procedures. However, if you have trouble making a Telnet connection, then please refer to the following section.

Telnet Access

You can Telnet into the switch from anywhere within the attached network. However, you must first configure the switch with a valid IP address, subnet mask, and default gateway. If you have trouble establishing a link to the on-board menu-driven configuration program, check to see if you have a valid network connection. Then verify that you entered the correct IP address from your remote Telnet location. Also, be sure the port through which you are connecting to the switch has not been disabled. (See Configuring Port Parameters on page 10.) If it has not been disabled, then check the network cabling that runs between your remote Telnet site and the switch.

Note: Only one Telnet connection at a time is supported. If one Telnet session already exists, a second Telnet connection will not be able to log into the system.

Pin Assignments for Serial Port Connections



DB9 Serial Port Pin Description

The DB9 serial port on the SwitchHub rear panel is used to connect the switch to a management device. The on-board menu-driven configuration program can be accessed from a terminal, a PC running a terminal emulation program, or from a remote location via a modem connection. You can use the management port to configure port settings (e.g., enabled or disabled), or to update device firmware. The pin assignments used to connect various device types to the switch's management port are provided in the following tables.

DB9 Port Pin Assignments

EIA Circuit	CCITT Signal	Description	Switch's DB9 DTE Pin #	PC DB9 DTE Pin #	Modem DB25 DCE Pin #	Signal Direction DTE-DCE
CF	109	**DCD** (Data Carrier Detected)	1	1	8	<---------
BB	104	**RxD** (Received Data)	2	2	3	<---------
BA	103	**TxD** (Transmitted Data)	3	3	2	--------->
CD	108.2	**DTR** (Data Terminal Ready)	4	4	20	--------->
AB	102	**SG** (Signal Ground)	5	5	7	---------
CC	107	**DSR** (Data Set Ready)	6	6	6	<---------
CA	105	**RTS** (Request-to-Send)	7	7	4	--------->
CB	106	**CTS** (Clear-to-Send)	8	8	5	<---------
CE	125	**RI** (Ring Indicator)	9	9	22	<---------

Connection from Switch's 9-Pin Serial Port to PC's 9-Pin COM Port

Switch's 9-Pin Serial Port	CCITT Signal	PC's 9-Pin COM Port
1 DCD	------- DCD --------	1
2 RXD	<----- TXD ---------	3
3 TXD	------- RXD ------>	2
4 DTR	------- DSR ------>	6
5 SGND	------- SGND ------	5
6 DSR	------- DTR --------	4
7 RTS	------- CTS ------>	8
8 CTS	<------ RTS --------	7
9 RI	------- RI ----------	9

Connection from Switch's 9-Pin Serial Port to Modem's 25-Pin DCE Port

Switch's 9-Pin Serial Port	CCITT Signal	Modem's 25-Pin COM Port
1	<------ DCD -------	8
2	<------ RXD -------	3
3	-------- TXD ------>	2
4	-------- DTR ------>	20
5	-------- SGND -----	7
6	<------ DSR -------	6
7	-------- RTS ------>	4
8	<------ CTS -------	5
9	<------ RI -------	22

Connection from Switch's 9-Pin Serial Port to PC's 25-Pin DTE Port

Switch's 9-Pin Serial Port	Null Modem	PC's 25-Pin DTE Port
1 DCD	1 — 1	8 DCD
2 RXD	2 — 3	3 TXD
3 TXD	3 — 2	2 RXD
4 DTR	4 — 8	20 DTR
5 SGND	5 — 20	7 SGND
6 DSR	6 — 7	6 DSR
7 RTS	7 — 4	4 RTS
8 CTS	9 — 5	5 CTS
9 RI	20 — 6	22 RI